Futek Advanced Sensor Technology, Inc.

TRS805

The versatile torque sensor for every speed range

Torque sensor

Introduction

The precise detection of torques at rotating drives and components is an important criterion of an effective product development and a safe quality control in production and assembly.

Therefore the torque sensor type **TRS805** provides a large number of flexible application possibilities.

TRS805

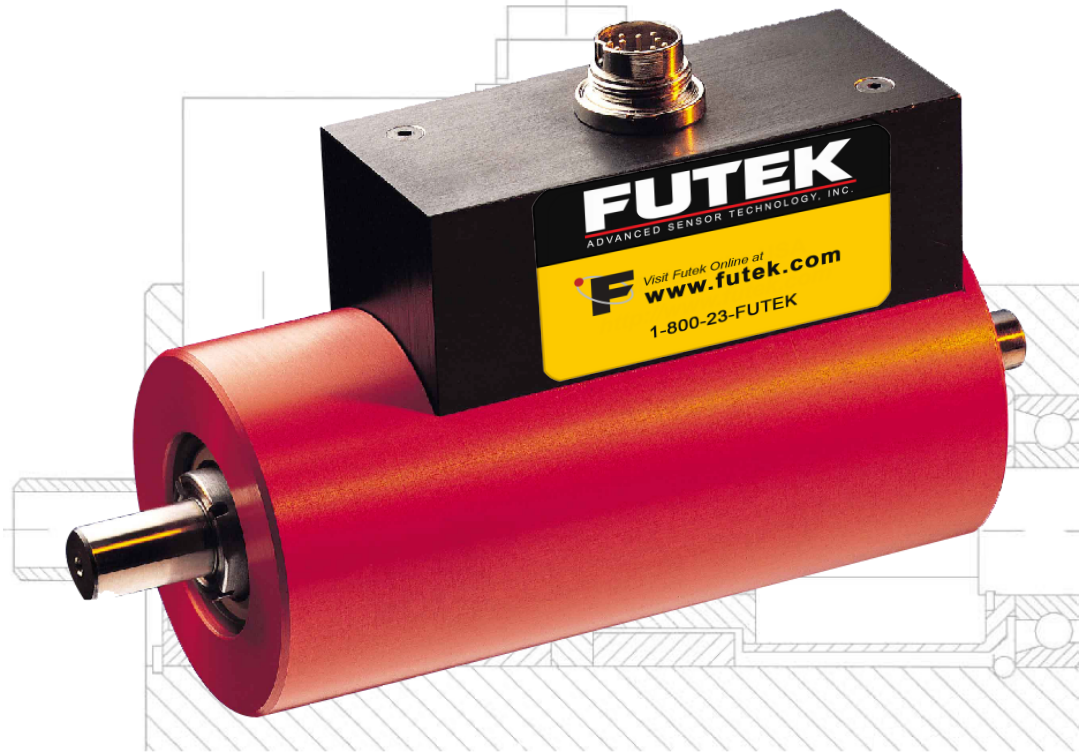
General

Torque sensors type **TRS805** use the strain gauge principle with absolutely new and very accurate integrated measuring electronics.

The torque signal is transmitted digitally without contact by the rotating shaft and transformed to an analog output signal.
There is also a possibility for electrical calibration of the sensor.
For different speed ranges (up to max. 50 000 rpm) there are two versions available.

Special features

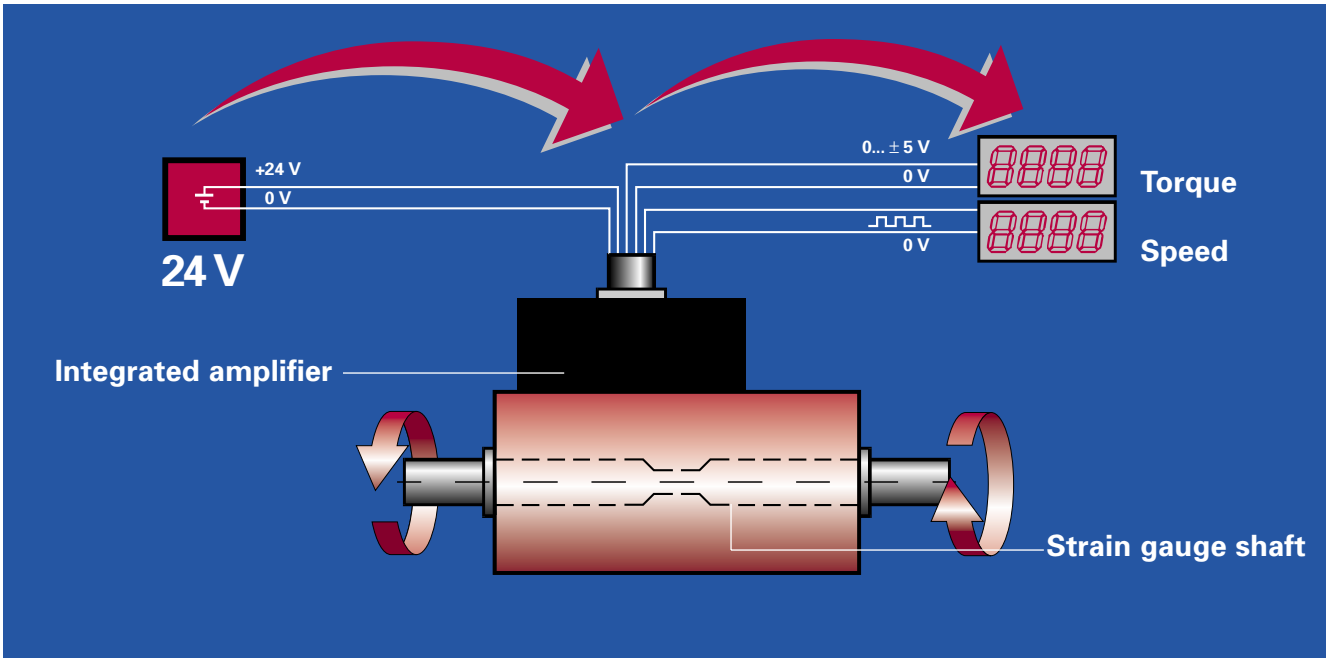
- Nominal torques between ± 0.2 Nm and 5000 Nm
- Speed range up to 50 000 rpm
- High measuring accuracy, ≤ 0.1%
- Supply voltage + 24 V DC
- Analog output for torque
- TTL speed pulses output
- Overload protection Size 1 is 3 Nm
- CE - permission
- Calibrated
  The used standards are conform with the accuracy determined by the PTB and according to DIN/ISO 9000



Limit values for dynamical load

Size	Rated torque Nm	Mass kg	Speed rpm	Test side			Drive side		
				max. Mass coupling kg	Transverse force in N	Thrustforce in N	max. Mass coupling kg	Transverse force in N	Thrustforce in N
1	0,2	0,8	20 000	0,07	10	50	0,25	100	50
	0,5			0,2	25	50	0,25	150	50
	1,0			0,2	50	50	0,25	200	50
2	2	1,4	20 000	0,2	100	50	0,25	200	50
	5			0,2	200	50	0,25	200	50
	10			0,2	200	50	0,25	200	50
	20			0,2	200	50	0,25	200	50
3	50	2,0	12 000	2,2	200	100	3,0	400	800
	100			3,0	400	200	3,0	800	800
4	200	5,0	8 000	3,5	400	200	10	2 000	2 000
	500			7	1 000	500	10	2 000	2 000
	1 000			10	2 000	1 000	10	2 000	2 000
5	2 000	18	5 000	40	4 000	2 000	40	10 000	10 000
	5 000			80	10 000	5 000	80	10 000	10 000
1	0,2	0,9	50 000	0,011	10	50	0,2	100	50
	0,5			0,34	25	50	0,2	150	50
	1,0			0,060	50	50	0,2	200	50
2	2	1,5	50 000	0,080	100	50	0,2	200	50
	5			0,10	200	50	0,2	200	50
	10			0,15	200	50	0,2	200	50
	20			0,20	200	50	0,2	200	50
3	50	2,1	30 000	0,38	200	100	2,5	200	100
	100			0,50	200	100	3,0	200	100
4	200	5,1	20 000	0,60	400	200	4	400	200
	500			1,2	400	200	4	400	200
	1 000			2,2	400	200	4	400	200
5	2 000	18	10 000	10	4 000	2 000	40	4 000	2 000
	5 000			25	4 000	2 000	80	4 000	2 000

Function principle



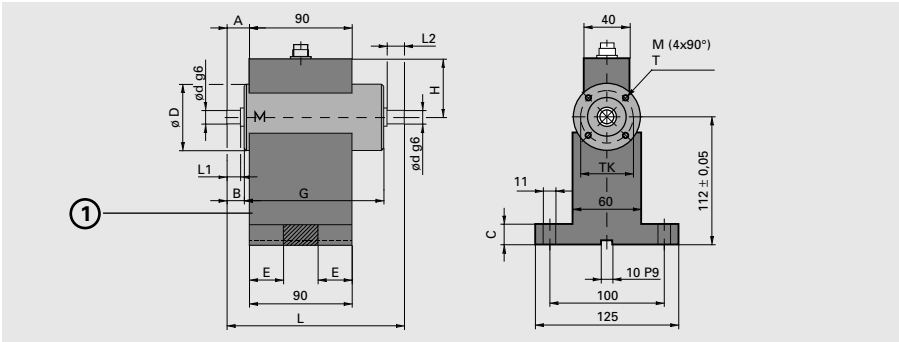
Dimensions

Size	1		2		3	4	5
Rated torque (Nm)	**0,2 / 0,5**	**1,0**	**2 / 5**	**10 / 20**	**50 / 100**	**200 / 500 / 1000**	**2000 / 5000**
L	160,5	159	163	166	180	267	418
L1	16	16	18	20	28	60	120
L2	16	16	18	20	28	61	120
Ø D	58	58	58	58	78	98	148
Ød g6	9	9	10	12	22	42[1)]	70[2)]
A	23,5	22	24	25	43,5	83,5	–
B	19	17,5	19,5	20,5	34	64,5	–
C	18		18		18	15	–
E	30		30		30	32	–
G	122		122		113	137	–
H	51		51		66	78	–
TK	46		46		64	87	132
M	M5		M5		M6	M6	M8
T	10 deep		10 deep		12 deep	12 deep	16 deep

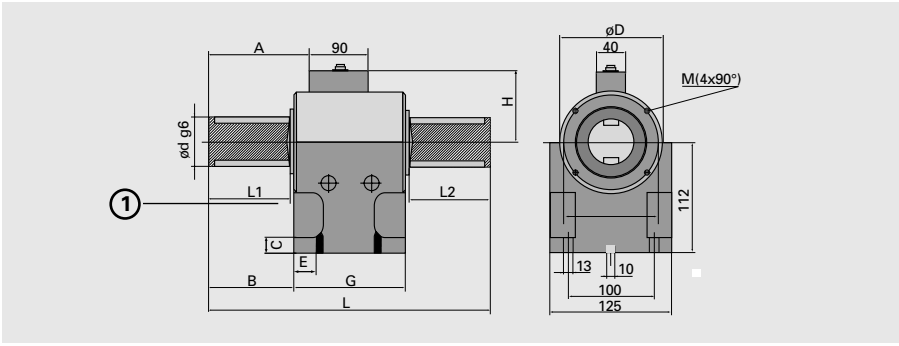
** All dimensions given in mm*

[1]) Both shaft ends with feather key slots (12 P9 x 50 / 2 x 180°) to DIN 6885, sheet 1
[2]) Both shaft ends with feather key slots (20 P9 x 110 / 2 x 180°) to DIN 6885, sheet 1

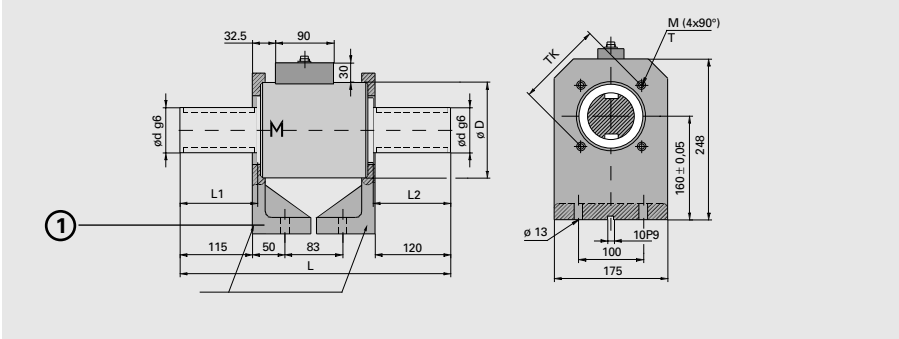
Sizes 1-3



Size 4



Size 5



1 = (Option) housing base „GU"
M = test side

Pin connection and description of built-in plug

Rated torque Nm	n_{max} „L“ rpm	Article No.	n_{max} „H“ rpm	Article No.	Springrate C Nm/rad	Moment of inertia J M/A kgcm²	Option „GU“ housing base Article No.
0,2	20 000	12823	50 000	12835	10	M 0,0005 / A 0,03	3799
0,5	20 000	12836	50 000	12837	10	M 0,0005 / A 0,03	3799
1,0	20 000	12838	50 000	12839	180	M 0,0005 / A 0,03	3799
2	20 000	12840	50 000	12841	250	M 0,003 / A 0,04	3799
5	20 000	12842	50 000	12843	450	M 0,003 / A 0,04	3799
10	20 000	12844	50 000	12845	520	M 0,003 / A 0,04	3799
20	20 000	12846	50 000	12847	580	M 0,0034 / A 0,04	3799
50	12 000	12849	30 000	12850	9 100	M 0,11 / A 0,2	3801
100	12 000	12851	30 000	12852	13 500	M 0,11 / A 0,2	3801
200	8000	12853	20 000	12854	60 000	M 4,0 / A 4,0	3922
500	8000	12855	20 000	12856	100 000	M 4,0 / A 4,0	3922
1000	8000	12857	20 000	12858	135 000	M 4,0 / A 4,0	3922
2000	5000	12859	10 000	12860	520 000	M 46,0 / A 46,0	4020
5000	5000	12861	10 000	12862	720 000	M 46,0 / A 46,0	4020

Note: M = test side / A = drive side

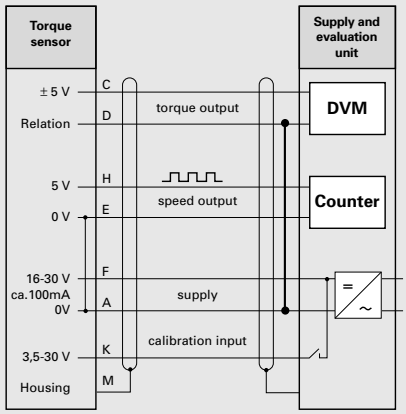
Accessories:

Connection cable:
ZCC918

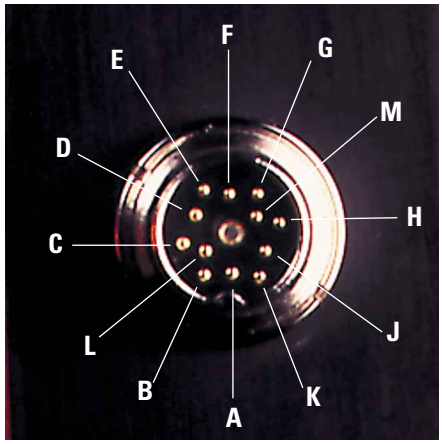
Mating plug:
GOD01259

Supply and Evaluation unit:
IBT100

Pin connection



Top view built-in plug



Function	Pin		Description
Supply	A	GND	relating to $+U_b$
	B	NC	
Torque output	C	U_a	±5V for rated torque to >2kΩ +5V for calibration result R_i=10Ω, output short circuit protected to GND
Torque output	D	GND	relating to U_a
Supply	E	GND	relating to Cal-/speed output
Supply	F	$+U_b$	+16V...+30V, 100 mA
	G	NC	
Speed pulses	H	N	60 pulses / turn
	J	NC	open collector output
Electric calibration	K	Kal	OFF: 0V...2V ON: 3,5V...30V Input resistance.: 10kΩ
	L	NC	
Shield	M	⏚	in sensor to housing

Technical data

Mechanical specifications

Overload capacity	1,3 x rated torque, 2 x rated torque with higher hysteresis
Rupture moment	> 5 x rated torque
Alternating torque, max.	1,0 x rated torque
Balncing class	Q= 6,3 for version „L“/ Q= 2,5 for version „H“
Bearing life	20 000h, at n_{max} 10 000h
Protection class according to VDI 2060.	IP 40
Speed transducer	60 pulses (M>30Nm)

Electrical measuring data

Nonlinearity	< ± 0,1 % of full scale
Hysteresis	< 0,1 % of full scale
Classification according to DIN 51 309	0.2 % (related to measured signal) up from 20 % of rated torque
Cutoff frequency	1 kHz
Output voltage	± 5,0 V at rated torque
Load resistance	> 10 kΩ
Rated temperature range	+ 10 °C...+60 °C
Operating temperature range	0 °C...+70 °C
Shelf temperature range	-25 °C...+80 °C
Temperature influence on zero	< ± 0.05 % / 10 K
Temperature influence on sesitivity	< ± 0.1% / 10 K
Torque control signal	100 % ± 0,2 %
Calibration input (* shunt calibration *)	„on“ > 3 V (max. 30 V) / „off“ < 1,5 V
Supply voltage	16...30 VDC
Supply current	200 mA

IBT100

Supply and evaluation instrument
for torque transducers and
force transducers

For more information see our product
page: http://www.futek.com/ibt100.aspx

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